

ARCHAEOLOGICAL EXCAVATIONS ON THE AIRE RIVER, OTWAY PENINSULA, VICTORIA

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Abstract

Aboriginal occupation deposits were excavated in two small rock shelters, in dune limestone, near the mouth of the Aire River. Both sites were stratified to a depth of several feet, and a C14 age estimation upon charcoal from a depth of 6 ft gave an age estimation of 370 ± 45 years. B.P. Molluscan remains from all levels typify the area at the present time. Although the area is well known as a collecting ground for carefully shaped and trimmed artefacts, no similar artefacts were excavated. Over 2300 struck stone flakes testify to the poverty of stone craftsmanship. A distinction is drawn between recent aboriginal material culture and an earlier prehistoric phase of superior stoneworking tradition. The finds are related to those from eroded midden sites around the coast.

Introduction

This report describes excavations conducted during January 1960 in two small rock-shelters in the dune limestone which fringes the coast of the Otway Peninsula, W. of the mouth of the Aire R. The Otway Peninsula is probably the least known Victorian tribal area, as 19th century records are virtually silent concerning its aboriginal inhabitants. However, for over half a century, collectors of stone implements have made rich finds of aboriginal artefacts on eroded surfaces, notably in the areas E. of the Cape Otway lighthouse and adjacent to the mouth of the Aire R. (cf. Mitchell 1949: 151-5). Their number and diversity of type testify to the relative intensity of prehistoric occupation. Indeed, environmental conditions in the southern peninsula, which projects into Bass Strait beyond the thickly forested Jurassic sandstone Otway ranges, must have favoured the aborigines. There was abundant fresh water. Occupation was facilitated by the occurrence of both shifting and consolidated dune ridges, rocky cliffs and boulder-strewn beaches, small lakes and marshy river flats, which ensured a wide variety of marine and aquatic food supplies and vegetation of varied utility. The timbered hinterland abounded in native animals.

Plentiful stone supplies were readily available in the beach shingle. Quartz pebbles and irregularly shaped nodules of flint are cast on the beach, either from submarine Tertiary beds, or exposures in the cliffs. [The geology of the area is described generally by Hall and Pritchard (1899) and Carter (1958).] Although this chert or flint is inferior to European supplies and possesses a deeply patinated cortex, it is easily flaked. The coastline from Cape Otway to beyond the South Australian border constitutes one of the rare sources of Australian flint. There is some evidence that it was a commodity valued for inter-tribal exchange over a wide area, but insufficient field work has been carried out to enable any definitive conclusion.

The rock-shelters both face the Otway ranges, allowing a superb vista across the river flats (Fig. 1). Shelter 1 is 165 yds from the Aire R. and almost 3 m. upstream from its mouth. The ocean is a mile away across the 300 ft high dune-limestone ridge, but the slope is steep and overgrown with brush, and the seaward side is edged with cliffs upwards of 200 ft in height. Easy access is available to the ocean beach at Castle Cove, 2 m. to the W., near the 'Glen Aire' station homestead.

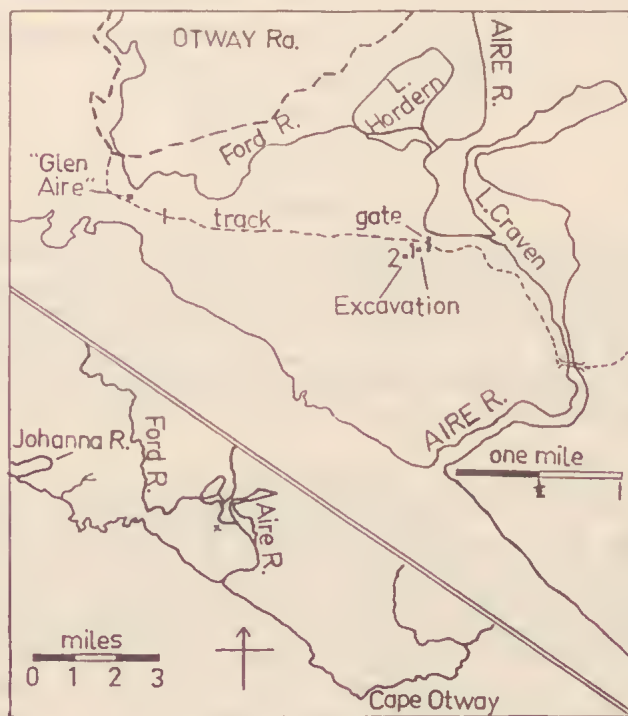


Fig. 1—Map of Aire River district.

In the absence of a detailed military survey map, it is difficult to supply a precise locality reference. In these circumstances, latitude and longitude ($38^{\circ}46'S.$, $143^{\circ}29'E.$) is only an approximation. Both sites are situated on Crown reserves. On the Victorian Lands Department map, Aire sheet, County of Polwarth, Shelter 1 is 44 yds W. of the SE. corner of Block 20 D. Shelter 2 is 79 yds W. of the same corner. Both sites are a few feet S. of the track which connects 'Glen Aire' with the bridge, a mile from the mouth of the Aire R. At present, a white gate across this track marks the relevant corner of Block 20 D.

The writer's attention was drawn to Shelter 1 by Mr Kingsley Sutton of Bal-larat, who visited the area on an implement collecting mission in company with Mr Donald Currie of Sydney. Australian prehistoric research has suffered through the attitude of those collectors who have concealed the location of valuable sites. In this case, however, in addition to admirable restraint in not investigating the site for themselves, the discoverers supplied precise instructions, enabling the writer and Mr D. A. Casey to visit the site and plan its excavation. On this preliminary survey, Shelter 2 was located, uphill from the other shelter, screened

behind a luxuriant boxthorn bush (*Lycium ferocissimum* Miers), a post-European plant introduction.

Aire Shelter 1

Unfortunately, most of the occupational deposit in Shelter 1 was removed some years ago. The material, chiefly shell and ash, had been scooped out by a front-end loader and used as filling for a track across marshy ground. As the plan (Fig. 2A) shows, the site was originally a large one, but only a narrow strip remained which clung tenuously to the rear wall. Natural erosion, rabbits and boxthorn roots had disturbed the remaining deposit which was exposed vertically for about 6 ft. The only practical course was to remove all the remaining deposit as a salvage measure.

Excavation demonstrated that the site was stratified and it is unfortunate that so much of it had been destroyed. Its area would have been far greater than was Shelter 2, but the remnant was so meagre that definitive conclusions were impossible. Immense numbers of marine shells, mixed with ash, occurred in superimposed layers or lenses, but the sharp outward curve of the rear wall, which became the basal floor at greater depth, meant that the lower layers were almost unrepresented (Pl. I). The large number of whole shells may indicate that molluscs were cooked, and the food extracted, without breaking the shell. The molluscan remains from both shelters are typical of the area at the present time and no significant variation of species was evident. The remains were predominantly the larger intertidal marine species, whose habitat is the rock-shelf, at and above mid-tide level; only a few freshwater mussels were present. Every species which was present in Shelter 1 was also identified from Shelter 2, and the list of remains is given there. Bone was uncommon and poorly preserved in the loose, dry sand and ash.

The deposit was divided into three layers, which have a stratigraphic basis, although it is not suggested that these relate to three distinct phases in the occupation of the site. The material recovered was negative in the extreme. Although 14 bone artefacts were present, not a single retouched stone flake was found among the 528 primary flakes and fragments.

LAYER 1

BONE ARTEFACTS: 1 fragmentary pointed bone, 3" in length.

STONE ARTEFACTS: 2 small quartz pebble hammer-stones; a large oval slab of dune limestone, apparently used as a lower millstone; 5 sandy limestone fragments, probably anvil-stones.

87 stone flakes, chips and cores were present; 68 were flint, 18 quartz and 1 chloritic sandstone.

LAYER 2

BONE ARTEFACTS: 1 flattened pointed bone, 2 $\frac{3}{4}$ " in length, broken at the other end; 2 bones, each c. 2" long, pointed at both ends and best described as muduks (fish gorges?): 2 round pointed bones, 1 $\frac{3}{4}$ " and 2" long—the base of each was ground obliquely across the diameter of the bone and rounded on the end, presumably a device to ensure a firm haft (Pl. IB, 4-5).

STONE ARTEFACTS: 7 quartz pebble hammer-stones; 5 flat water-worn limestone pebbles, which had been used for pounding and abrading, and 1 chloritic rock, possibly utilized as an anvil-stone; 1 small, oval flint core, subsequently utilized as a crude scraper. Flakes, and chip fragments num-

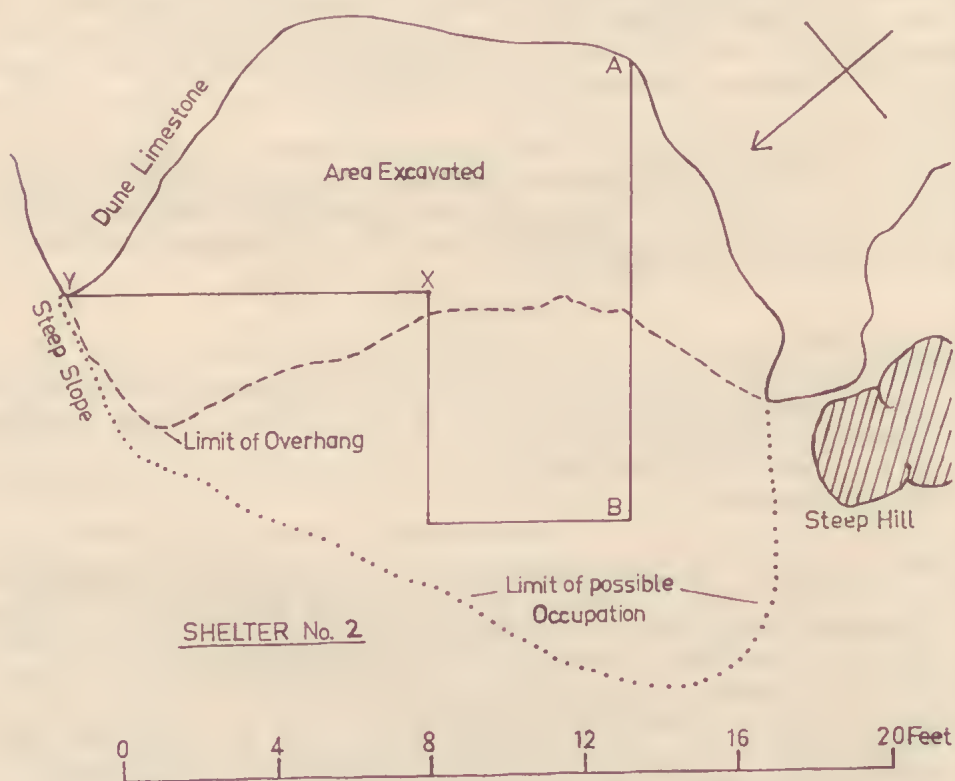
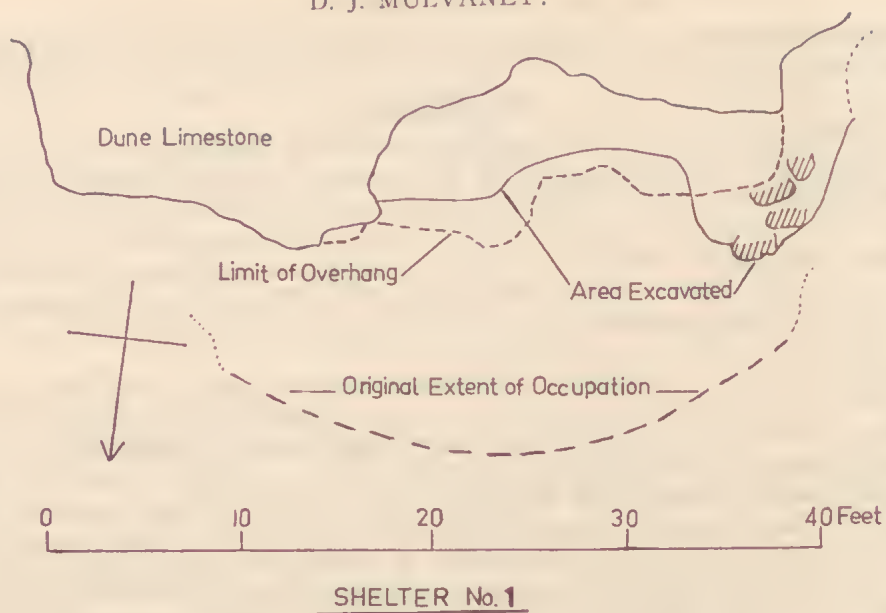


Fig. 2—A—Plan of Shelter 1; B—Plan of Shelter 2.

bered 195; 168 were flint, 23 quartz, 3 quartzite and 1 diabase. The small diabase fragment is similar to the diabase or epidiorite at Ceres, near Geelong.

LAYER 3

BONE ARTEFACTS: 7 points, ranging from $\frac{3}{4}$ " to 3" in length, made from split flat bones, ground to a point at one end; 1 thin round bone, $2\frac{1}{4}$ " long, tapering to a point, but in a poor state of preservation.

STONE ARTEFACTS: 7 quartz and 3 limestone pebble hammer-stones. There were 5 small red ferruginized silt-clay fragments which could have been utilized for decorative purposes. Flakes and other fragments totalled 242; 198 were flint, 40 quartz, 3 green chert pebble fragments, and 1 large rounded indeterminate basic rock fragment, possibly weathered basalt.

Aire Shelter 2

More positive results were obtained in the second shelter, most of which was excavated. The excavation could be extended further down the slope outside the shelter, but the steepness of the slope and the root systems of living vegetation would impede progress and limit the area of profitable study (Fig. 2B). The deposit was well stratified and had not been disturbed by burrowing animals. At the N. end of the shelter, traces of human occupation extended to a depth of almost 8 ft, although the lower horizons consisted simply of alternating bands of ashy black or clean yellow sand, and were free of artefacts, shells or bones. The deposit at the S. end was shallower than at the steeply-shelving N. end; however, it was intensively occupied. Charcoal from a depth of almost 6 ft in the centre of this shelter gave a radiocarbon 14 age estimation of 370 ± 45 years (Fig. 3).

LAYER 1

This was a deep, loosely packed accumulation of clean grey or yellow sand, most of which must have trickled down from the steep hillside above the S. end of the site. A thick carpet of dead grass covered the floor. During the preparatory removal of this rubbish, a worked bone artefact was found lying exposed on the surface beneath the plant cover. It was a point in a perfect state of preservation, clean and new in appearance. As no other evidence for human activity was uncovered until near the base of this stratum, it must be concluded that the accumulation of layer 1 began during the latest phase of aboriginal occupation, probably less than a century ago. The bone implement is best explained as one which was concealed in a cavity in the rock wall which was kept moist by seepage from above, and which only became dislodged during recent years. The point had close affinities with artefacts in layer 2.

BONE ARTEFACTS: The pointed bone mentioned above was made from solid bone, probably cut from a macropid limb-bone. It was highly polished, 3" in length and squared obliquely at the basal extremity. Numerous fine scratches were visible on most ground surfaces (Pl. IB, 1). 3 other utilized bones occurred near the base of this horizon—2 were thin bird-bones, 3" and $3\frac{1}{2}$ " in length, ground to needle-sharp points and the other was a thick bone, 3" long, deliberately flattened in section and tapered to a solid point at one end (Pl. III, 2-3, 12).

STONE ARTEFACTS: 1 large quartz pebble fragment and a smaller specimen of hornfels, which probably functioned as hammer-stones; 1 large fragment



Fig. 3—Vertical Sections of Shelter 2.

of an indeterminate basic rock is doubtfully classified as an anvil-stone. Flakes and fragments numbered 107; 104 were flint, 2 quartz and 1 was an indeterminate basic rock.

MOLLUSCS: *Austrocochlea constricta* (Lamk)—periwinkle; *Brachidontes rostratus* (Dunker)—mussel; *Cellana tramoserica* (Sowerby)—limpet; *Dicathais textilosa* (Lamk)—thaid; *Hipponyx conicus* (Sch.), *Lasaca australis* (Lamk)—small bivalve; *Poneroplax costatus* (Blainville)—chiton; *Scutus antipodes* (Montfort)—elephant snail; *Siphonaria diemenesis* Q and G., *Subnivalia undulata* (Solander)—turban shells; *Velesunio* sp?—fresh water mussel.

MAMMALS: *Trichosurus* sp. prob. *vulpecula*—possum; *Antechinus* sp. prob. *swainsonii*—phascogale; *Rattus lutreolus* (Gray), *Rattus assimilis* Gould; *Mastacomys fuscus* Thomas. Also present were 2 seal teeth, *Pinnipedia* prob. *Gypsophoca* sp. and indeterminate fragments of fish and bird bone.

LAYER 2

This stratum was fairly compact, deep grey and black in colour throughout, flecked with pieces of charcoal and numerous shells. These indications of intense occupation were supported by the number of stone flakes retrieved and the occurrence of 25 bone tools.

A human skeleton lay directly upon the firm surface of this horizon (Pl. II B). The sex was male and the age of death was around 25 years. The period of death must have been during the closing phases of aboriginal occupation as, stratigraphically, the remains related to the beginning of layer 1 times. Although the surviving bones were in a good state of preservation, there were unusual circumstances. No evidence of a grave was found; the bones were widely scattered, the pelvis and skull were together, while a humerus was found almost 2 ft from the nearest bone; the bones of the feet, hands and several vertebrae were absent; the extremities of most limb bones were eroded or marked. The most likely conclusion is that the person died in the shelter and that his body was disturbed by animals. It should not be classed as a burial. It could be urged that the body had been exposed and dessicated before its removal to the shelter, and it is relevant that Brough Smyth (1878: xxviii) recorded that 'on the swampy reed beds of the Aire River . . . are found even now the remains of the rude platforms on which the natives placed their dead'. However, the excavated remains differed from the characteristic tight bundle of reburied dessicated bones; nor is there evidence of respect for the deceased. A report, which the writer has been unable to confirm, states that the aborigines on the Aire R. were shot by native police, under the command of Foster Fyans, as a reprisal for their murder of a surveyor, near Blanket Bay around 1845. It is possible that these remains are those of a wounded survivor who crawled into this last refuge.

BONE ARTEFACTS: 8 carefully finished points, between 1½" and 4" in length, and a broken tip of another specimen. These artefacts show considerable variety of finish on the butt end, and fine scratches are visible on some of them. 2 specimens possibly were awls, while the remainder probably functioned as projectile-points (Pl. III, 1, 4-7). One specimen is fusiform, although only one end has a sharp point (Pl. III, 9). 16 fragments of split bone which had been either cut or ground to points were also recovered. Of interest were 2 fragments of split bone (one of which had been broken

in antiquity) which had deep grooves incised into them (Pl. I B, 2-3). The bones were probably limb bones of kangaroo and had been split lengthways; one bone was $\frac{1}{4}$ " thick. Presumably, both specimens represented attempts to remove a section of bone for reshaping into a point. The groove ran lengthways along the exterior surface of the bone and had been cut with a fine, sharp-edged implement which had been drawn along the bone on several occasions. In the absence of any evidence for burins or other secondary artefacts in the stone collection, it must be assumed that the bones were grooved with a primary flake of flint, many of which possessed keen edges.

STONE ARTEFACTS: 1 circular flint flake with traces of secondary retouch around the margin and therefore designated a scraper; 5 small flint flakes, not true scrapers, but possessing utilization fractures along the edges; 2 small flint cores; 8 pebbles of dune limestone and 1 of concretionary limestone, which possibly served as hammer-stones and anvil-stones; 1 quartz pebble hammer-stone. Flakes and other fragments numbered 1017, 1002 were flint, 12 quartz, 2 heavily ferruginized clay pebbles, and 1 fragment of basic calcareous sediment. There was one small fragment of red ochre.

MOLLUSCS: *Brachidontes rostratus* (Dunker), *Cabestana spengleri* (Perry), *Cellana tramoserica* (Sowerby), *Dicathais textilosa* (Lamk), *Haliotis ruber* Leach—mutton-fish; *Patellana peroni* (Blainville), *Poneroplax costatus* (Blainville), *Scutus antipodes* Montfort, *Subnivalia undulata* (Solander).

MAMMALS: *Thylogale billardieri* Desmarest, *Rattus assimilis* Gould, *Pseudocheirus peregrinus laniginosus* (Gould), *Macropadidae* (indeterminate).

Also present were indeterminate remains of bird, fish, 2 seal incisors (*Pinnipedia* prob. *Gypsophoca* sp.) and one large canine tooth of *Pinnipedia*, species indeterminate.

LAYER 3

This was a thick, grey horizon, rich in ash, which was subdivided into three for precision of record.

LAYER 3A

BONE ARTEFACTS: 1 spatulate-ended bone, broken at the other end; 1 pointed, round bone, $3\frac{1}{2}$ " long, broken at the basal extremity; 1 solid fusiform point, $2\frac{3}{4}$ " in length, of mudukian proportions (Pl. III); 1 fragment of highly burnished bird bone; 3 split bones, cut to sharp points.

STONE ARTEFACTS: 1 quartz pebble hammer-stone; 1 small dune limestone pebble anvil-stone, with a deep pit on one face; 1 irregular shaped tabular limestone fragment, probably a millstone; 2 dune limestone and 1 white concretionary limestone hammer-stones. Flakes and other fragments numbered 181, 169 were flint, 9 quartz, 1 quartzite, 1 rounded broken fragment of basic tuff and 1 of basic felspathic sediment. There were 2 small fragments of red ochre.

MOLLUSCS: *Brachidontes rostratus* (Dunker), *Cabestana spengleri* (Perry), *Cellana tramoserica* (Sowerby), *Chloritobadistes victoriae* (Cox)—land shell; *Dicathais textilosa* (Lamk), *Haliotis ruber* Leach, *Hipponyx conicus* (Sch.), *Kellia australia* (Lamk), *Lepsiella vinosa* (Lamk), *Melarapha prae-*

termisa (May)—periwinkle; *Poneroplax costatus* (Blainville), *Scutus antipodes* Montfort, *Subnivalia undulata* (Solander).

MAMMALS: *Rattus lutreolis* (Gray), macropid remains and indeterminate bone fragments.

Also present was parrot-fish: *Phargmogonathi*, Fam.: *Labridae*.

LAYER 3B

BONE ARTEFACTS: A point, 4" in length, broken at the basal extremity and tapering to a well-formed point at the other (Pl. III, 8); 1 round, fusiform bone, 3½" long, with an asymmetrical taper at one end (Pl. III, 10). Its function was probably as a projectile tip, although it may have been a nose-bone ornament; 1 symmetrical fusiform bone, 3" long, similar to the last specimen (Pl. III, 11); 4 simple pointed bones, ranging between 1¾" and 2¼" in length, of which two had been cut and the other two ground to points.

STONE ARTEFACTS: 2 limestone fragments, possibly anvil-stones or hammer-stones; 1 broken, edge-ground axe, 3" in diameter, 1" in thickness, of which only 2" at the blade-end survives. This is a classic Windang-type axe-head (McCarthy 1946: 47), made from a split pebble of albitized trachyte. One side of the blade preserves the original smooth pebble surface, while the other surface has been lightly ground, although there was little attempt to produce a sharp cutting-edge. This discovery is of some interest. It is one of the few Australian edge-ground axes whose stratigraphic position is known, and it is made from an unusual rock. Similar rocks are unknown in the Otway area. Trachytic rocks occur at Macedon and Woodend, but they are not recorded as affected by albitization. Victorian albite rocks are chiefly of Cambrian origin, but no trachytes have been recorded of Cambrian age. At present, therefore, the source of this stone is unknown, but it must lie beyond the Otway region.

Flakes and other fragments numbered 129, 108 were flint, 14 quartz, 2 limestone, 1 sandstone, 1 quartzite, 1 albitized trachyte and 2 tabular fragments of felspathic sediment. There was 1 minute fragment of reddish-brown ochre.

MOLLUSCS: *Brachidontes rostratus* (Dunker), *Haliotis ruber* Leach, *Scutus antipodes* Montfort, *Subnivalia undulata* (Solander), *Vesunio ambiguus* (Philippi).

LAYER 3C

BONE ARTEFACTS: 5 small points made from split bone, 2 of which were subsequently ground; 1 thin, fusiform bone, 3¼" in length, which had been artificially flattened.

STONE ARTEFACTS: 2 quartz pebble hammer-stones; 1 small green silicified ?tuff pebble hammer-stone; 1 rounded 'canon-ball' concretion of calcareous felspathic sandstone, 3" in diameter, apparently used on an upper millstone. Flakes and other fragments numbered 84, 77 were flint, 5 quartz, 1 pink polyzoal foraminiferal limestone and 1 felspathic sandstone.

MOLLUSCS: *Austrosuccinea australis* (Ferussac)—a land snail; *Brachidontes rostratus* (Dunker), *Cellana tramoserica* (Sowerby), *Chiazacmea flammae*

(Q. and G.), *Chloritabadiestes victariae* (Cox), *Hipponyx canicus* (Schmücker), *Lepsiella vinosa* (Lamk), *Patellanax peroni* (Blainville), *Patellaida alticostata* (Angas)—limpet; *Paneraplex castatus* (Blainville), *Subninella undulata* (Solander).

LAYER 4

This horizon consisted of clear yellow sand, with some lenses of hearth material. It was clear that the site was less intensively occupied during this period. The radiocarbon sample, R-728, came from a confined area in the centre of the shelter near the base of this horizon. It consisted of charcoal lumps whose age was estimated at 370 ± 45 years.

BONE ARTEFACTS: 2 flat fragments of cut bone, $1\frac{3}{4}$ " and $3\frac{3}{4}$ " long, subsequently ground to points; 1 pointed bone $5\frac{1}{2}$ " in length, which had been split and then ground at the tip; 1 point, 3" long, broken at the basal end.

STONE ARTEFACTS: Fragments of 4 quartz pebble hammer-stones; 1 deeply patinated white concretionary limestone nodule, $3\frac{1}{2}$ " across and 1" thick, which had been crudely flaked, bifacially, around half its perimeter. Flakes and other fragments numbered 136. 123 were flint, 9 quartz, 2 pinkish polyzoal-foraminiferal limestone, 1 sandy limestone and 1 ferruginized silt-clay.

MOLLUSCS: *Brachidantes rostratus* (Dunker), *Celana tramaseric* (Sowerby), *Chloritabadiestes victariae* (Cox), *Dicathais textilis* (Lamk), *Haliotis ruber* Leach, *Patellanax peroni* (Blainville), *Poneraplex castatus* (Blainville), *Scutus antipades* Montfort, *Subninella undulata* (Solander).

One macropid incisor, some bones of 'parrot-fish', and other indeterminate bone fragments of mammals, birds and fish, were present.

LAYER 5

At the S. end of the trench, this stratum rested on bedrock, and it consisted chiefly of clean yellow decomposed rock. Nearer the centre of the trench, where the rock floor sloped steeply downwards, yellow bands alternated with horizons of black hearth material. The deposit was a firm, smooth sand, very easy to trowel.

ARTEFACTS: No artefacts of bone or stone were recovered. Flakes and other fragments numbered 78. 61 were flint and 17 quartz.

MOLLUSCS: *Brachidantes rostratus* (Dunker), *Celana tramaseric* (Sowerby), *Chloritabadiestes victariae* (Cox), *Dicathais textilis* (Lamk), *Patellanax peroni* (Blainville), *Subninella undulata* (Solander).

LAYER 5A

The division between layers 5 and 5A was arbitrary in the sense that there was no marked stratigraphic break. Alternating bands and lenses of clean yellow sand and ashy material continued down to bedrock at the N. end of the shelter. At the extreme NW. corner of the trench, the rock floor was sloping steeply downhill and the area available for excavation was very confined.

ARTEFACTS: 1 broken quartz pebble hammer-stone, with pronounced abrasion; 2 chunky, pointed primary flakes with faint traces of utilization fracture along the sharpest edge. Flakes and other fragments numbered 22. 12 were flint, and 10 quartz.

A few indeterminate fragments of mammalian bones were present.

Summary of Excavated Finds

Layer No.	Bone Artefacts	Stone Artefacts	Hammer and Anvil-stones	Flakes etc.	C 14 (B.P.)
SHELTER 1:					
1	1	—	7	87	
2	5	1?	13	195	
3	8	—	10	242	
Totals	14	1?	30	524	
SHELTER 2:					
1	4	—	3	107	
2	24	1+5?	10	1017	
3A	7	—	5	181	
3B	7	1 axe	2	129	
3C	6	—	3	84	
4	4	1	4	136	370 ± 45
5	—	—	—	78	
5A	—	—	1	22	
Totals	52	3+5?	28	1754	

Discussion

It is unfortunate that the evidence accumulated was so meagre. However, if these sites can be considered as typical of recent aboriginal camping places, they provide a useful insight into the nature of recent Victorian culture. On a first acquaintance, the evidence suggests that this was merely some prehistoric seafood bar, whose specialized material remains need not be fully representative of the culture of the Otway tribe. Indeed, the fleeting and selective character of habitation on Victorian coastal sites has been stressed by most writers, including Kenyon (1912) and Spencer (1918; 1928: 500), whose opinions on aboriginal stone utilization conditioned subsequent thought in Victoria. Describing the stone flakes found among the middens on Wilson's Promontory, Spencer (1918: 114) commented that they

'are of the crudest possible form. . . . It is only very rarely that any well-made implement is found in the middens, which do not indicate the permanent camps of the natives. They were only . . . temporary eating places—the real camping grounds lying further inland. We only found one ground axe and . . . a bone awl; but such more highly developed implements are of rare occurrence, and must have been accidentally left behind'.

It is interesting to consider Spencer's assumptions in the light of Glen Aire. There is no doubt that the stone material at Aire was of elementary type. 2278 flakes and other fragments were found, yet only about 4 specimens, including one edge-ground axe, could be classified, typologically, as artefacts. For a 'stone age' people, the Otway aborigines were singularly loathe to fashion stone implements. Not a single primary flake or core possessed flake-scars which indicated any particular skill in stone-working. However, despite this apparent agreement between Spencer's opinion and the excavated material, there are many points of difference. While it cannot be denied that the occupation of the Aire sites may have fluctuated seasonally, this is a truism for all aboriginal camping places. Spencer's inference that permanent camps existed away from the coast is doubt-

ful. At least conditions were favourable for the relatively intensive exploitation of the Aire valley, and camps should have been as permanent there as inland. The fact that 5 ft of deposit accumulated during the 270 ± 45 years of pre-European tenancy of Shelter 2, is a pointer to the popularity of the site. It is significant that almost all the molluscan remains were marine species, because as explained above, they were carried to the site from upwards of 2 m. distant, and this suggests a deliberate intention to camp at the site. Consequently, it appears legitimate to classify these shelters as regular aboriginal abodes, and therefore the excavated remains should be a representative cross-section of material culture.

The large number of excavated hammer-stones and struck flakes are proof that stone-working was practised on the site. Therefore, the complete lack of secondary retouch is significant, because surface collections from the vicinity include numerous products of expert stone craftsmen, particularly those areas near the Cape Otway lighthouse, E. of the Aire R. mouth, and between 'Glen Aire' and the Johanna R. Members of this expedition discovered geometric microliths, bond-points and grooved, hammer-dressed, ground axes 3 m. to the W. of the site. It may be postulated, therefore, that the tradition of careful stone implement production had already ceased to condition the material culture and typological preferences of the Otway aborigines, at the time when they first occupied the shelters, perhaps four centuries ago. This means that the untrimmed primary flakes must have been utilized for all the purposes for which the more conventional implements were employed during earlier times. In this eventuality, they were implements and cannot be classified as 'waste flakes'.

Whether the obvious poverty of stone culture at Glen Aire is characteristic of all recent Victorian prehistory is a problem meriting future investigation. If it is, there is an alternative explanation for the occurrence of so few retouched artefacts in coastal middens. It is not, as Spencer believed, because middens were the refuse left by selective and impermanent visitors whose normal abode was further inland. The explanation is that these middens are all so recent that they belong to the latest phase of Victorian prehistory. To a period, that is, when finely made stone artefacts had ceased to be a characteristic of aboriginal culture, whether in coastal or inland areas. It is relevant to note that, at some period, coastal aborigines possessed carefully trimmed artefacts, and such specimens are exposed along the Otway Peninsula. This proves that Spencer was wrong in assuming that 'more highly developed implements' could only be expected in the hinterland. The actual position during the period of European penetration has been obscured by the wide distribution of microlithic artefacts, which, some have assumed erroneously, were in current use amongst the aborigines. It appears to the writer that an objective appraisal of other evidence confirms the general validity of the Glen Aire pattern. Museum collections of ethnographic material have been inspected, together with the best descriptions of material culture, particularly Thomas (1859), Brough Smyth (1878) and Dawson (1881).

It has become evident that, with the exception of edge-ground implements, Victorian aborigines during the last century did not employ stone implements with secondary retouch. Items of material culture which were basic in other parts of the continent, but which were absent in Victoria, included the stone-headed spear, the stone-tipped adze or spear-thrower and the stone knife-blade, with hafted handle or resinous hand-grip. Stone was employed in the 'death spear' to form barbs, but these were simply single or double rows of small, jagged, primary flakes,

which would escape both typological or archaeological identification. Similar stone chips are recorded as cutting or scraping tools (Smyth 1878, i: 304, 381).

Research has convinced the writer that the basic industrial materials of recent Victorian prehistory were of organic origin, most of which could not be expected to survive for archaeological discovery. These materials included wood, bone, animal teeth, reeds, and mussel shell. It is interesting to reflect that, at the time of European settlement, except for the knowledge of edge-grinding, Victorian stonework was possibly less varied than Tasmanian lithic culture. No explanation can be offered, at this stage, for the abandonment of fine implement production throughout Victoria. It is worth noting that even the quality of axe production deteriorated. The attractive hammer-dressed, edge-ground, grooved axes, which are widely distributed in Victoria, all belong to an earlier period. At least no hafted specimen was collected from the living tribes. Of course, prehistory recognizes no State boundaries, and while these observations apply particularly to Victoria, similar evidence is available across the border in South Australia, where excavation has demonstrated a deterioration in stone craftsmanship during the past 3000 years (Mulvaney 1960: 74).

In the light of this analysis, the surviving bone artefacts at Glen Aire may be considered as standard equipment in aboriginal tool assemblages. Smyth (1878, i: 271, 277, 307, 350) and Dawson (1881: 8) catalogue the types of utilized bones. These included pegs for pinning and stretching animal skins for the drying process, long awls for piercing and sewing the skins, finer needles for line ornamentation on the inside of the cloak and long pins for fastening the finished garment. In addition, they were used as nose-bone ornaments, and the tips and barbs of reed and wooden spears. The Glen Aire artefacts may have been used for all these purposes. Awls were present in the assemblage, and other bones accord with Smyth's description of nose-bone ornaments (1878: 271). Other specimens resemble fish gorges, although Smyth (1878: 202, 391) was only acquainted with wooden gorges in Victoria. Kenyon (1912: 104) believed that most midden bones were used to remove molluscs from their shells.

A bone industry comparable with the excavated material has been reported at many localities around the Victorian coast. In almost every case these finds appear to have been associated with middens exposed in recent dunes. The classic region is in the dune ridges between Port Fairy and Warrnambool, in Western Victoria. The finds from this area have been mentioned at numerous times during the past 50 years, but the most detailed description is that by Mitchell (1958). The National Museum of Victoria has a large collection of artefacts from the area, including a total of 298 utilized bones collected by A. S. Kenyon near Koroit between 1903 and 1918. These specimens, and those illustrated by Mitchell (1958: 195), all have parallels with the Glen Aire material. It is interesting that a Koroit midden deposit has been radiocarbon 14 dated to 538 ± 200 years (C—601; Gill 1955), which is comparable with the 370 ± 45 years estimate for the earliest bone artefacts at Glen Aire.

Smyth (1878, i: 240) provides a detailed description of the finds made in a dune midden to the E. of Cape Otway lighthouse. They included an edge-ground axe and a variety of bone tools, whose description accords with the Glen Aire finds, 10 m. away. Similar bone tools have been reported further east along the Victorian coast, in recent midden deposits at Cape Patterson (*ibid.*: 241) and Wilson's Promontory (Spencer 1918). However, bone artefacts are not confined

to the coastal fringe. They are recorded from inland sites at Camperdown (Smyth 1878, i: 365), Leigh River (Mitchell 1958: 199) and Glenthompson (information, Mr K. Sutton).

It is evident that the Glen Aire discoveries were negative and of little intrinsic merit. However, they highlighted features which may prove to be relevant to any assessment of Victorian prehistory. It is hoped that further excavations within the immediate future will test the validity of suggestions advanced here. It is, indeed, unfortunate that the aborigines of recent Victorian prehistory did so little to endear themselves to the archaeologist.

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Explanation of Plates

PLATE I

- A—The deposit in Shelter 1, looking W., at a late stage of the excavation.
 B—Bone artefacts excavated in Shelters 1 and 2.

PLATE II

- A—General view of Shelter 2 looking SE.
 B—The human remains lying on the surface of layer 2, Shelter 2.

PLATE III

- Bone artefacts from Shelter 2.